

Office Action Summary

Application No.

09/839,862

Applicant(s)

KIM ET AL.

Examiner

Mary C Hogan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This application has been examined.
2. **Claims 1-22** have been examined and rejected.

Specification

3. The disclosure is objected to because of the following informalities. Appropriate correction is required.
4. Page 2, summary item 3, “by providing a providing a result...” should be corrected to read “by providing a result...”.
5. Page 3, last 2 sentences, “a virtual surgery, an image...” should read, “a virtual surgery, and an image...”.
6. Page 9-10: the description of the elements in Figure 9 do not match up with the drawing.

Drawings

7. The drawings are objected to because of the following. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
8. **Figures 8 and 9** are objected to because the lines and arrows in the picture overlap the text in the drawing, making the text difficult to read.

Claim Objections

9. **Claims 3 and 13** are objected to because of the following informalities. Appropriate correction is required.
10. **Claims 3 and 13** recite the limitation “taking a photographic picture of the patient’s hard tissue”. “Hard tissue” was interpreted to be the internal structure of the specimen being prepared for surgery such as the bones or skeletal structure. Therefore, it is unclear how a photograph will be taken of the hard tissue. Further, the specification’s explanation of Figure 1 describes that photographic pictures of the patient were taken as the picture of the soft tissue and gives no mention to a photograph taken of the hard tissue. Therefore, it is unclear as to whether the claim limitation should read “hard tissue” or “soft tissue”.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
12. **Claims 10 and 17** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.
13. **Claims 10 and 17** recite the limitation “the step of generating 2-D pictures of the 3-D visualization result”, however, the specification (page 5) does not give an adequate description of how this step is performed.

Claim Interpretation

14. As to the objection to **Claims 3 and 13** discussed above, in light of the description of Figure 1 in the specification, the claims were interpreted to read “taking a photographic picture of the patient’s *soft tissue*”.
15. **Claims 10 and 17** recite the limitation “the step of generating 2-D pictures of the 3-D visualization result”, however, the specification (page 5) does not give an adequate description of how this step is performed. The specification states, “2-D pictures from various angles may be generated by

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projection from the 3-D visualization...” (page 5). From this explanation, it was concluded that the 2-D pictures generated were just pictures of the model from various angles.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. **Claims 1-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Forte et al (**Forte et al**, “3D Facial Reconstruction and Visualization of Ancient Egyptian Mummies Using Spiral CT Data”, ACM SIGGRAPH 99 Conference page 223, 1999), herein referred to as **Forte**, and further in view of Ross et al (U.S. Patent Number 6,608,628), herein referred to as **Ross**.

19. As to **Claims 1, 11 and 18**, **Forte** teaches: taking pictures of the patient's hard and soft tissue (**Figures 3 and 4, page 5, item 3, page 6, item 5**); preparing preprocessing data (**page 9, paragraph 1**); and deriving changes in the patient's soft tissue according to the changes in the hard tissue (**page 8, second paragraph, “Our aim...”, page 13, last sentence –page 14, first sentence**).

20. **Forte** teaches that this method will be used for future developments in virtual surgery. However, **Forte** does not expressly teach the performing of virtual surgery by manipulating the patient's hard tissue making changes in the hard tissue.

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21. **Ross** teaches performing of virtual surgery by manipulating the patient's hard tissue making changes in the hard tissue (**column 4, lines 23-26,33-42**), which includes a reconstruction unit for the generation of 3-D images to prepare preprocessing data necessary for virtual surgery (**column 4, lines 58-61**), wherein the service of a virtual surgery center is used that is connected to a doctor through a network (**Figure 2, element 22 and description, Figure 12A and description**).

22. Since **Forte** teaches that the method of deriving changes in the soft tissue as a result of changes in hard tissue can be used in virtual surgery, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the invention as taught by **Forte** in connection with the virtual surgery system as taught by **Ross** which includes the manipulation of a patient's hard tissue.

23. As to **Claims 2 and 12**, **Forte** teaches: the method of claim 1, wherein the step of taking data comprises the step of taking an x-ray picture of the patient's hard tissue (**page 5, section 3, paragraph 2, last sentence**).

24. As to **Claims 3 and 13**, **Forte** teaches: the method of claim 1, wherein the step of taking data comprises the step of taking a photographic picture of the patient's soft tissue (**Figure 4, page 6, section 5, sentence 3**).

25. As to **Claims 4 and 14**, **Forte** and **Ross** teach: the method of claim 1, wherein the step of preparing preprocessing data comprises the step of: generating a personalized 3-D model of the patient (**Forte: page 5, section 3, paragraph 1, Ross: column 4, lines 58-62**).

26. As to **Claims 5 and 15**, **Forte** teaches: the method of claim 4, wherein the step of generating a personalized 3-D model comprises the steps of: extracting an outline of the patient by overlaying the hard tissue picture and the soft tissue picture and extracting feature points of the patient by overlapping the outline onto a standard model containing outlines and standard feature points of a representative person (**page 6, section 5, page 13-page 14**).

27. As to **Claims 6-8**, **Ross** teaches: the method of Claim 1, wherein the step of manipulation includes cutting, displacing and rotating the hard tissue (**column 4, lines 33-38**).

28. As to **Claims 9 and 16**, **Ross** teaches: the method of Claim 1, further comprising the step of visualizing the result of the virtual surgery in 3-D (**column 11, lines 5-8, lines 22-29**).

29. As to **Claims 10 and 17**, **Forte** shows generating 2-D pictures of the 3-D visualization (**Figures 19 and 25**) wherein the model is shown from various angles.

30. As to **Claim 19**, **Ross** teaches: the method of claim 18, wherein the network is the Internet (**column 12, lines 31-34**).

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31. As to **Claims 20-22, Ross** teaches: wherein the virtual surgery center has a virtual surgery consulting group for providing consulting service related to virtual surgery (**column 11, lines 22-34**) wherein the group of doctors using this system can include an orthodontic dentist or plastic surgeon.

Conclusion

32. The prior art made of record, see PTO 892, and not relied upon is considered pertinent to applicant's disclosure, careful consideration must be given prior to Applicant's response to this Office Action.

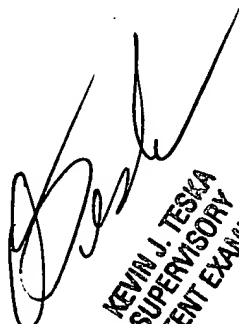
33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C Hogan whose telephone number is 571-272-3712. The examiner can normally be reached on 7:30AM-5PM Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary C Hogan

Examiner

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